AIR FORCE

QUALIFICATION TRAINING PACKAGE (AFQTP)

for

ELECTRICAL POWER PRODUCTION

(3E0X2)

MODULE 17

LUBRICATING SYSTEMS

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MODULE 17

LUBRICATING SYSTEMS

Career Field Education and Training Plan (CFETP) references from 1 Apr 97 version.

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AIR FORCE QUALIFICATION TRAINING PACKAGES
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INTRODUCTION

Before starting this AFQTP, refer to and read the "Trainee/Trainer Guide" located on the AFCESA Web site **http://www.afcesa.af.mil/**

AFQTPs are mandatory and must be completed to fulfill task knowledge requirements on core and diamond tasks for upgrade training. ***It is important for the trainer and trainee to understand*** that an AFQTP ***does not*** replace hands-on training, nor will completion of an AFQTP meet the requirement for core task certification. AFQTPs will be used in conjunction with applicable technical references and hands-on training.

AFQTPs and Certification and Testing (CerTest) must be used as minimum upgrade requirements for Diamond tasks.

MANDATORY minimum upgrade requirements:

Core task:
AFQTP completion
Hands-on certification

Diamond task:
AFQTP completion
CerTest completion (80% minimum to pass)

Note: *Trainees will receive hands-on certification training for Diamond Tasks when equipment becomes available either at home station or at a TDY location.*

Put this package to use. Subject matter experts under the direction and guidance of HQ AFCESA/CEOT revised this AFQTP. If you have any recommendations for improving this document, please contact the Career Field Manager at the address below.

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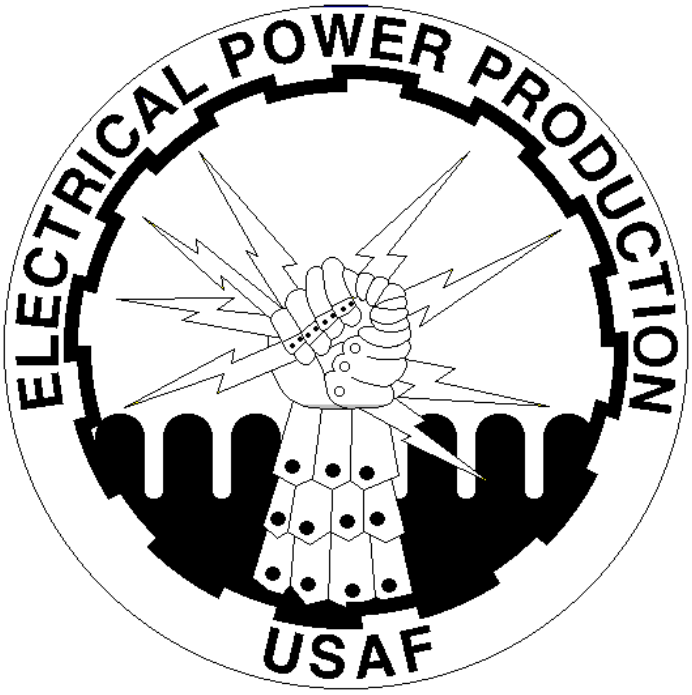


LUBRICATING SYSTEMS

MODULE 17 **AFQTP UNIT 2**

PERFORM TEST OF LUBE OIL (17.2.)

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

PERFORM TEST OF LUBE OIL

Task Training Guide

STS Reference Number/Title:	17.2., Perform test of lube oil
Training References:	• 35C2 series Technical Order • Manufacturers Manual • Local Procedures
Prerequisites:	• Possess a 3E032 AFSC
Equipment/Tools Required:	• Applicable technical references • Standard Tool box, and Lube oil test kit • Personal Safety Equipment • Associated items, i.e. rags, drip pans/containers
Learning Objective:	• Test lube oil systems and determine what course of action must be taken.
Samples of Behavior:	• Trainee must understand the purpose of test kits, determine the condition of the lube oil and what course of action most be taken.
Notes:	
• To successfully complete this element follow the steps outlined in the applicable technical manual exactly--no exceptions. • Prior to performing any maintenance, technician MUST isolate the starting system, and apply lockout and tag-out procedures • Any safety violation is an automatic failure.	

PERFORM TEST OF LUBE OIL

Background: Oil is the life blood of the engine. It lubricates, protects, cleans and is used to transfer heat. Changing oil and filter(s) at the specified intervals will increase the longevity of the engine by ridding the engine of contaminants. Consider operation hours, load, atmospheric conditions, and operating temperature levels to adjust those specific intervals. Watch for buildup of contamination (e.g. sludge, varnish, water and fuel dilution). Their presents not only impair the oils ability to lubricate, but indicate s poor engine performance.

Oil analysis is one way to maintain your equipment in top operating condition by preempting engine malfunctions. There are several methods used to test the oil for contaminates; sending an oil sample to a laboratory or field test. We will discuss what you will be required to perform.

Analyze oil samples at every oil change or every 1000 hours of operating time for prime power generators. For standby or mobile generators, analyze oil samples every six months or every 100 hours of operation. Check for loss of viscosity, acid content (total acid and base number), particulate, water and other contaminates. You may need to adjust the oil change interval based on the periodic tests. Limit fuel oil dilution to 5 percent and carbon contamination to 15 percent from the new oil condition. Remember; when in doubt, change it.

LUBE OIL TEST

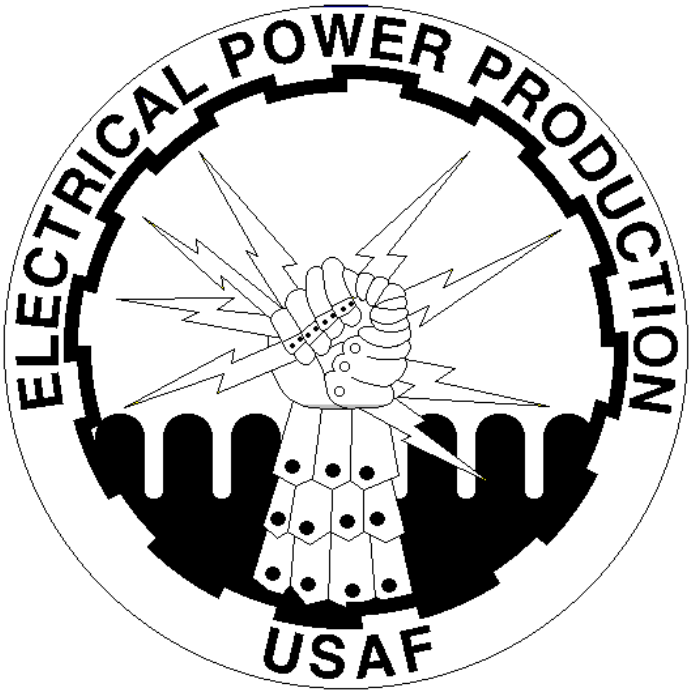
To perform these tasks, complete: **AFQTP, CD-ROM, 3E0X2-17C Lubricating Systems**

NOTE: **There are tests after each section in the CD-ROM. Complete each section and answer the questions.**

PERFORM TEST OF LUBE OIL

Performance Checklist		
Step	**Yes**	**No**
Did trainee perform the following:		
1. Gathered required equipment		
2. Tested oil for diesel fuel dilution		
3. Tested oil for solid contaminants (Blotter Test)		
4. Tested oil for reaction (Acidity)		
5. Visually checked for water in oil		

FEEDBACK: Trainer should provide both positive and/or negative feedback to the trainee immediately after the task is performed. This will ensure the issue is still fresh in the mind of both the trainee and trainer.



LUBRICATING SYSTEMS

MODULE 17 **AFQTP UNIT 3**

SERVICE LUBRICATING OIL SYSTEM (17.3.)

Notice. This AFQTP is *NOT* intended to replace the applicable technical references nor is it intended to replace hands-on training. It is to be used in conjunction with these for training purposes only.

SERVICE LUBRICATING OIL SYSTEM

Task Training Guide

STS Reference Number/Title:	17.3., Service Lubricating Oil System
Training References:	• 35C2 series Technical Order • Manufacturers Manual • Local Procedures
Prerequisites:	• Possess a 3E032 AFSC
Equipment/Tools Required:	• Applicable Technical References • General tool kit • Personal safety equipment
Learning Objective:	• Service a lubricating oil system .
Samples of Behavior:	• Trainee will service the components of the lubricating oil system.
Notes:	
• To successfully complete this element follow the steps outlined in the applicable technical manual exactly--no exceptions. • Prior to performing any maintenance, technician MUST isolate the starting system, and apply lockout and tag-out procedures • Any safety violation is an automatic failure.	

SERVICE LUBRICATING OIL SYSTEM

Background: The oil is the life blood of the engine. Oil lubricates and protects the internal engine parts. The lubricating system should be drained and refilled periodically, as directed by local policy, to rid the lube oil system of contaminants. Small diesel engines used as standby units do not require oil changes at the same interval as continuously operating units (prime generators). Generally, on small units, lube oil is drained and discarded and new oil filters are installed at every oil change--annually. On large power units, the oil capacity and the need for continuous operation may require oil centrifuge and oil addition rather than short, periodic changes. In cold weather operations lube oil may need changing more often due to increased contamination and sludge.

Lubricating oil should always be drained while the engine is at normal operating temperature. This assures a better draining of the system and removes wax deposits and other impurities as they are suspended in the oil.

Oily rags, filters and waste oil must be contained and disposed of in accordance with local directives and policies. This waste is categorized as **hazardous material items**. Some local areas have an oil filter recycle program.

To perform these tasks, complete: **AFQTP, CD-ROM, 3E0X2-15C Engine Start Systems**

NOTE: **There are tests after each section in the CD-ROM. Complete each section and answer the questions.**

SERVICE LUBRICATING OIL SYSTEM

Performance Checklist		
Step	**Yes**	**No**
Did trainee perform the following:		
1. Gathered required equipment		
2. Operate engine to operating temperature		
3. Have required filters and gaskets on-hand		
4. Changed lube oil		
5. Changed lube oil filters		
6. Changed lube oil strainers (if applicable)		
7. Checked the crankcase ventilator		
8. Filled crankcase with oil		
9. Checked the oil dipstick		
10.Operated unit and checked for leaks		
11.Document performed maintenance		

FEEDBACK: Trainer should discuss with the trainee any items, the trainer determined the trainee did not successfully accomplish. Feedback should be immediate, so the issue is fresh in the mind of the trainee and the trainer.